

REMARKS

The following is responsive to the Patent Office Action mailed September 30, 2004. First, the Applicant would like to thank Examiner Omgba for the notation of the errors on pages 1 and 5 of the specification and indication of allowability of Claims 8 and 16. Claim 1 has been amended to recite that the guide portion has “a frustoconical outer surface tapered inwardly from said end portion and an angle of between three and seven degrees,” including a “major” diameter substantially equal to or greater than an internal diameter of the bore. Thus, the Applicant respectfully submits that Claim 1 now patentably distinguishes over the prior art cited by the Examiner based upon the finding that Claim 8 includes allowable subject matter. That is, the features of Claims 5 and 8 have been incorporated in Claim 1 and thus Claim 1 should be allowed by the Examiner. Claims 5 and 8 have been cancelled and Claims 2 to 4, 6, 7 and 10 have also been amended to conform to Claim 1, as amended.

Claim 11, as Amended:

Claim 11 was rejected by the Examiner as anticipated by U.S. Patent No. 3,276,499 of *Reusser*. The Applicant respectfully submits that Claim 11 *as filed* is not anticipated by *Reusser* because Claim 1 as filed included the limitation that the planar end face of the plunger includes an “axial bore” and that the generally cylindrical guide element is “releasably retained in said axial bore of said plunger.” However, Claim 12 which includes similar limitations was rejected by the Examiner as unpatentable over *Reusser* in view of the teaching of U.S. Patent No. 4,389,766 of *Capuano* and Japanese Patent No. 362050021 A of *Kitaura*. It is recognized that the Japanese *Kitaura* patent discloses a plunger 10 having an axial threaded bore receiving a threaded stud 12 having a head portion including a cylindrical outer surface 12b and a frustoconical surface 12a, as shown in Figures 6 to 9. For the purposes of this argument only, it is assumed from the translation of the Abstract and the “Constitution” that the “slant face 12a” is received in the cylindrical part 2 of the nut is

correct. However, the purpose of the unnamed head (12a and 12b) of the stud 12 is for an entirely different purpose. First, as shown in Figures 7 to 9, the nut 1 is fixed in an opening 9a of the die member 9 and thus the nut 1 cannot move relative to the panel. Instead, an annular or “cylindrical part 2” of the nut 1 is received through a previously formed opening in the panel 6 as shown in Figures 6 and 7 (*not in the threaded bore 3*) and the frustoconical internal surface 12a then engages a frustoconical surface in the nut 1 serving as a stop *limiting movement of the plunger 10* and the “cylindrical part 2” is then folded over the panel as shown in Figure 9. That is, the threaded stud 12 *does not and cannot* center the nut 1 on the panel 6 and the head of the threaded bore *is not and cannot be received in the threaded bore 3*. Thus, the Applicant respectfully submits that it would *not be obvious* to combine the teaching of the Japanese *Kitaura* patent with the teaching of the *Reusser* patent and there is no teaching or suggestion in either of the patents for the combination suggested by the Examiner.

However, Claim 11 has now been amended to specifically recite that the “generally cylindrical guide element” is “formed of a material *softer than said pierce nuts* including an outer diameter *greater than* an internal diameter” of the threaded bore, thereby “forming an interference fit with said threaded bore.” Such limitations are clearly not disclosed or suggested by the prior art as discussed further below.

Claim 14, which recites that the “generally cylindrical guide element is formed of a hard polymer,” was rejected by the Examiner as “an obvious matter of design choice wherein no stated problem is solved or unexpected results (are) obtained in forming the cylindrical portion of a hard polymer versus the material disclosed by *Reusser*.” The Applicant respectfully traverses this finding. The specification at page 7, beginning at line 16, states the following:

In the preferred embodiment, the nut guide element 68 is formed of a material which is softer than the pierce nuts 56, such as a non-ferrous

metal, including brass or a low carbon steel, but most preferably a polymer, such as nylon, where the major diameter of the frustoconical outer surface 80 of the head portion 78 is equal to or slightly greater than the minor or crest diameter of the threaded bore 86 of the pierce nut 56 as best illustrated in Figure 3.

As also stated in the specification in several locations, a principal object of this is to accurately place a pierce nut on a panel to reduce “the number of required datums” by “permitting the use of the axis of the bores of the pierce nuts attached to the panel as the datum for alignment” and to prevent cocking of the pierce nuts in the plunger passage. (See, e.g. page 3, lines 18 to 24). Thus, by forming the guide element of a material softer than the pierce nut having a major diameter equal to or greater than the threaded bore of the pierce nut and forming an interference fit, the pierce nut is very accurately aligned on the plunger eliminating the requirement for datums measured between the circumference of the thread cylinders of the pierce nuts. The guide element may be replaced if worn or to accommodate nuts having different size bores. Thus, forming the guide element of a material softer than the pierce nuts having a diameter equal to or greater than the threaded bore is *not an obvious matter of design choice and serves a very useful purpose*. Further, because the guide element is formed of a softer material, the guide element is preferably releasably fixed to the plunger to permit replacement. The specification further emphasizes the diameter relationship between the guide element and the diameter of the threaded bore of the pierce nut in paragraph [00009] (page 4, line 10), as follows:

In a preferred embodiment, the generally cylindrical portion (of the guide element) is formed of a material which is softer than the pierce nut, such as a hard polymer and the generally cylindrical projection is frustoconical having a major diameter adjacent the end portion of the plunger having a diameter equal to or slightly greater than the crest diameter of the pierce nut bore providing *very accurate alignment* of the pierce nut installed on a panel and preventing cocking of the pierce nut in the plunger bore as described above (emphasis added).

The primary *Reusser* reference does disclose a pierce nut and a method of attachment to a panel, wherein the plunger or punch P includes an *integral axial pilot portion 16* which

is “adapted to slideably fit within the threaded portion of the nut blank 1.” (col. 4, lines 63 to 66). Based upon the term “axial pilot,” it will be assumed that the longitudinal axial extension 16 which has a length less than the axial length of the pierce nut 1 guides or centers the pierce nut 1 on the punch P. However, because the axial pilot portion 16 is *integral* with the punch P and the punch P must be formed of a material harder than the nut 1, typically steel, it must also be assumed that the axial pilot 16 is formed of steel harder than the nut 1. Thus, the outer diameter of the axial pilot 16 must be smaller than the internal diameter of the threaded bore 2 to avoid damage to the threaded bore 2 during installation. As will be understood, damage to the threaded bore 2 may be render the pierce nut useless. That is, it may not be possible to thread a male threaded fastener into the threaded bore 2 of the nut 1 if the threaded bore is damaged. Thus, the outer diameter of the axial pilot 16 *cannot be equal to or greater than* the internal diameter of the threaded bore.

The *Capuano* patent discloses a method of attaching a pierce nut 10 to a panel 12, wherein the ram or plunger 118 includes a “tool 92 (which) is freely moveable axially through the internal threaded central opening of the fastener 10” and the tool includes a cylindrical end portion 112 which engages the crest of the internally threaded bore of the nut 10 for alignment and the lower or leading end portion 114 of the tool 92 tapers slightly inwardly from the cylindrical base 112 to enable the center section or pilot 24 of the pierce nut to be resiliently deflected inwardly as shown in Figure 6. (col. 7, lines 17 to 29). However, as shown in Figures 5 and 6 of the *Capuano* patent, it is *critical* that the “tool 92” be resiliently bias away from the punch 118 to “stretch” the panel portion 36 (see Figures 6 and 7) into a dome-shape prior to piercing and thus the “tool 92” of *Capuano* cannot be “releasably fixed” in the bore of the punch 118 as set forth in Claim 11. Further, it would not be obvious to combine the teaching of the *Capuano* patent with the disclosure of the *Reusser* patent because the “tool 92” of *Reusser* requires that the tool 92 be spring biased from the

plunger 108 and moveable relative to the ram 118. Finally, as set forth above, it would not be obvious to combine the Japanese *Kitaura* patent with the teaching of either the *Reusser* patent or the *Capuano* patent because the purpose of the stud 12 in the end of the plunger 10 is to bottom in the frustoconical internal surface of the nut 1 and does not and cannot enter the threaded portion 3. The Applicant therefore respectfully submits that Claim 11 as amended patentably distinguishes over the prior art cited by the Examiner. A more detailed discussion of the dependent claims is set forth below.

Claim 17 as Amended:

Claim 17 as amended includes the limitations of Claim 11 discussed above including a “guide portion” which is “releasably fixed to said planar end face of said plunger and formed of a material softer than said pierce nuts” and having a diameter adjacent the planar end face “equal to or greater than an internal diameter of said threaded bore” and further reciting that the “guide portion” is frustoconical having a “major diameter” equal to or greater than an internal diameter of the threaded bore.

Claim 17 was rejected prior to this Amendment as unpatentable over the *Reusser* patent in view of the teaching of the *Capuano* patent, wherein the Examiner relied upon the frustoconical outer surface of the portion 114 of the “tool 92” disclosed in the *Capuano* patent and stated that it would be obvious to one of ordinary skill in the art at the time the invention was made to have designed the guide portion of the plunger of *Reusser* frustoconical with a major diameter at the end of the plunger substantially equal to the internal diameter of the bore of the pierce nuts in view of the teaching of the *Capuano* patent. However, as set forth above, it would not be obvious to combine the teaching of the *Capuano* patent with the disclosure of the *Reusser* patent because the tool 92 cannot be “releasably fixed” to the end of the plunger 118 or the method disclosed in the *Capuano* patent would be *inoperative*. There is no teaching, suggestion or motivation for the

combination of *Reusser* and *Capuano* in the disclosures of these patents and the combination would be contrary to the teaching of both references. Thus, the Applicant respectfully submits that the combination of references proposed by the Examiner is improper.

Claim 17 as amended, however, further requires that the “frustoconical guide portion” be “releasably fixed to said planar end face of said plunger and formed of a material softer than said pierce nut” which is directly contrary to the teaching of any of the prior references. As set forth above, the selection of a material for the frustoconical guide portion of a material softer than the pierce nuts is not merely a matter of choice or design as initially found by the Examiner and the advantages are supported by the specification of this application. Therefore, the Applicant respectfully requests reconsideration and allowance of Claim 17, as amended.

Patentability of the Dependent Claims:

Claim 2, which is dependent from Claim 1, recites that the guide portion “is removably attached to the end portion of the plunger.” Claim 2 was rejected by the Examiner as anticipated by *Reusser*. Although this rejection is not understood because the “axial pilot 16” of *Reusser* is integral with the punch P as set forth above, it is recognized that Claims 3 and 4 were rejected by the Examiner as unpatentable over the *Reusser* patent in view of the teaching of the Japanese *Kitaura* patent under 35 U.S.C. § 103. Claim 2 recites that the “generally cylindrical guide portion is threadably attached to said end portion of said plunger” and Claim 4 further recites that the planar end portion of the plunger “includes a threaded axial opening and said generally cylindrical guide portion includes a male threaded end portion threadably received in said threaded axial opening.” However, as set forth above, the bolt 12 on the end of the plunger 10 of the Japanese *Kitaura* patent is for *an entirely different purpose* than the axial pilot 16 of the *Reusser* patent, which is to limit axial movement of the plunger or punch 10, wherein the frustoconical end portion 12a engages a

frustoconical internal surface of the nut 1, the plunger deforms the tubular end 2 of the nut 1 and the head portion of the bolt 12 is not and cannot be received in the threaded bore 3. Thus, the Applicant respectfully submits that it would not be obvious to combine the teaching of the Japanese *Kitaura* patent with the teaching of the *Reusser* patent and there is not suggestion or motivation disclosed in either of the references for the proposed combination. Claims 12 and 19 have the same limitations as Claim 4 and, therefore, the Applicant respectfully submits that Claims 12 and 19 patentably define over the prior art for the same reason.

Dependent Claims 6, 14 and 20 recite that the guide portion is “formed of a hard polymer.” Claim 6 was rejected as obvious from the teaching of the *Reusser* patent and Claims 14 and 20 were rejected as unpatentable over the *Reusser* patent in view of the teaching of the *Capuano* patent under 35 U.S.C. § 103. As set forth above, the Examiner held that the selection of a hard polymer for the guide element “is an obvious matter of design choice wherein no stated problem is solved or unexpected results obtained in the forming of the cylindrical portion of a hard polymer versus the material disclosed” in the prior art. For the reasons set forth above, the Applicant respectfully traverses this finding and respectfully submits that the advantages are clearly set forth in the specification as set forth above.

Claim 7, which is dependent upon Claim 6 and Claim 15, which is dependent upon Claim 14 discussed above, further recites that the frustoconical guide portion has a major diameter “greater than said internal diameter of said threaded bore of said pierce nuts.” Claims 7 and 15 were rejected by the Examiner as unpatentable over *Reusser* in view of the teaching of *Capuano* under 35 U.S.C. § 103. The Applicant respectfully traverses this rejection for the following reasons. First, as set forth above, it would not be obvious to combine the teaching of the *Capuano* patent with the disclosure of the *Reusser* patent

because there is no suggestion or motivation for the combination in the references. Second, the combination of references even if proper would not result in a frustoconical guide portion having a major diameter greater than the internal diameter of the bore of the pierce nuts because the *Capuano* reference teaches that the cylindrical portion “engages the crest of the threaded convolution 26” of the bore, but would deform the threaded bore if the cylindrical portion were greater than the internal diameter of the threaded bore. The claim combination can only be achieved where the guide portion is formed of a material softer than the nut, preferably “formed of a hard polymer” to avoid damage to the threaded bore as described above.

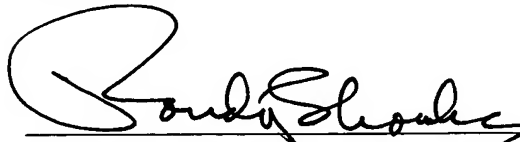
Claim 9, which is also dependent upon Claim 7, recites that the frustoconical guide portion “has an axial length less than an axial length of said bore of said pierce nuts.” Claim 9 was rejected by the Examiner as unpatentable over the *Reusser* patent in view of the teaching of the *Capuano* patent. It is recognized that the axial pilot 16 disclosed in the *Reusser* patent has an axial length less than the pierce nut 1; however, the “tool 92” disclosed in the *Capuano* patent *must have an axial length* greater than the axial length of the pierce nut 10 or the method disclosed in the *Capuano* patent would be inoperative because the spherical end portion 94 would not engage the panel to form a dome-shaped portion 36, which is essential to the method disclosed in the *Capuano* patent. Thus, the Applicant respectfully submits that it would not be obvious to combine the teaching of the *Capuano* patent with the disclosure of the *Reusser* patent as set forth in Claim 9 of this application.

The Applicant therefore respectfully submits that the dependent claims also patentably define over the prior art cited by the Examiner for the reasons set forth above. Therefore, the Applicant respectfully submits that the amended claims remaining in this application patentably distinguish over the prior art and allowance of this application is now respectfully requested.

Although it is believed that no fee is due for the filing of this Amendment, the Commissioner is authorized to charge our Deposit Account No. 08-2789 for any additional fees or credit the account for any overpayments regarding this Amendment. Further and favorable reconsideration of the outstanding Office Action is hereby requested.

Respectfully submitted,

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I hereby certify that the enclosed **Amendment** is being deposited with the United States Postal Service as Express Mail, postage prepaid, in an envelope as "Express Mail Post Office to Addressee," Mailing Label No. **EV489349467US** and addressed to **Mail Stop Non-Fee Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on **October 15, 2004**.



Tracy L. Smith

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